Remedial Task: Common assessment 1

Name: _____

Section A: Theory

Question 1

(a) Define density.

.....

(b) State the formula needed to calculate the density.

.....

(c) The density of aluminium is 2.70 g/cm³. The thickness of a rectangular sheet of aluminium foil varies, but is much less than 1 mm. A student wishes to find the average thickness. She obtains the following measurements:

mass of sheet = 60.7 g

length of sheet = 50.0 cm

width of sheet = 30.0 cm

Calculate the student's values for:

(i) the volume of the sheet,

volume = ...

(ii) the average thickness of the sheet.

thickness = ...

Question 2

(a) Fig. 3.1 shows a skier descending a hillside. Fig. 3.2 shows the speed/time graph of his motion.

Fig. 3.1

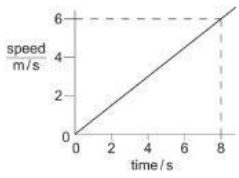


Fig. 3.2

(i) How can you tell that the acceleration of the skier is constant during the 8 s shown on the graph?

.....

.....

(ii) Calculate the acceleration of the skier. (*hint: gradient*)

acceleration = ...

Question 3

Fig. 1.1 shows the speed-time graph for a bus during tests. At time t = 0, the driver starts to brake.

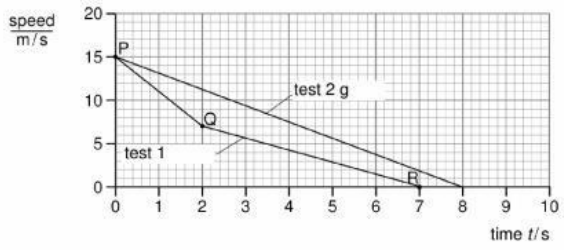


Fig. 1.1

(a) For test 1:

(i) determine how long the bus takes to stop,

.....

(ii) state which part of the graph shows the greatest deceleration, (*answer PQ or QR*)

.....

(iii) use the graph to determine how far the bus travels in the first 2 seconds. (*How far = distance travelled)*

distance = ...

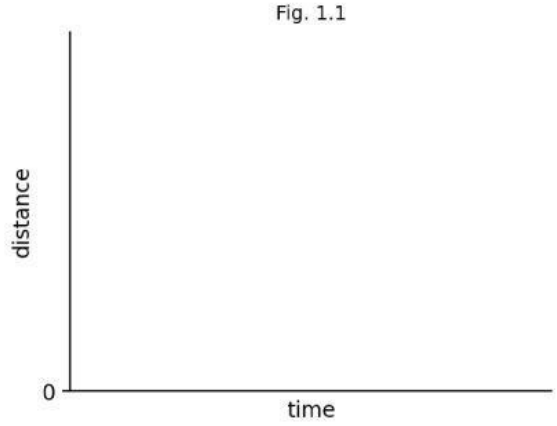
(b) Calculate the value of the deceleration in **test 2**.

deceleration = ...

Question 4

A bus travels at a constant speed. It stops for a short time and then travels at a higher constant speed. Using the axes in Fig. 1.1, **draw** a distance-time graph for this bus journey.

Fig. 1.1



Question 5

Fig. 1.1 shows the speed-time graph for a car travelling along a straight road. The graph shows how the speed of the car changes as the car passes through a small town.

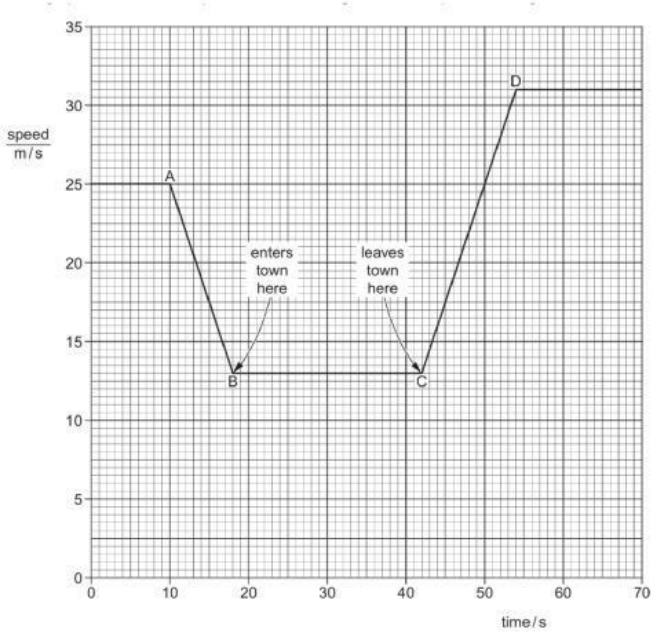


Fig. 1.1

Point B (18, 16) Point C (42, 16)

(a) Calculate the distance between the start of the **town** and the end of the **town**. (look carefully at the graph!)

distance = ...

(b) Calculate the acceleration of the car between C and D.

acceleration = ...

Question 6

(a) Figs. 1.1 and 1.2 show speed-time graphs for two objects, each moving in a straight line.

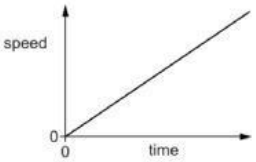


Fig. 1.1

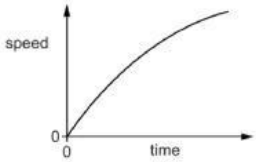


Fig. 1.2

(i) Describe the motion of the object shown by the graph in Fig. 1.1.

.....

.....

(ii) Describe the motion of the object shown by the graph in Fig. 1.2.

.....

.....

(b) Figs. 1.3 shows distance-time graphs for two objects, each moving in a straight line.

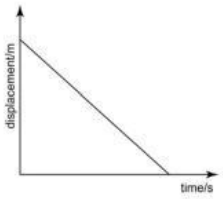


Fig.1.3

Describe the motion of the object shown by the graph in Fig. 1.3.

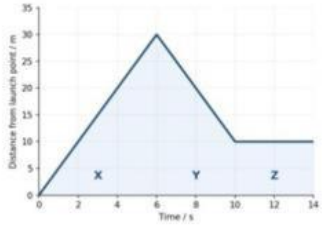
.....

.....

Section B: Multiple Choice

Question 7

The graph shows how the distance of a delivery drone from its launch point changes with time, in three sections X, Y and Z.



During which section is the drone moving back towards its launch point?

A. The drone never moves back towards its launch point

B. Y

C. Z

D. X

Question 8

A raindrop falls from a cloud. Initially, air resistance is small compared to its weight, so the raindrop accelerates.

What happens to the raindrop's acceleration as its speed increases?

A. The acceleration becomes negative, causing the raindrop to slow down

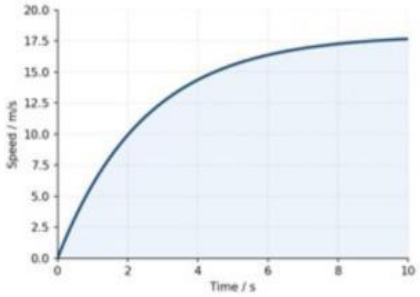
B. The acceleration stays constant at 9.8 m/s^2 throughout the fall

C. The acceleration increases steadily throughout the fall

D. The acceleration decreases, reaching zero once air resistance equals its weight

Question 9

The speed-time graph shows the motion of a motorbike. The line is a curve that becomes less steep as time goes on, while the speed keeps increasing.



What does this show about the motorbike's acceleration?

A. The acceleration is increasing

B. The motorbike is decelerating

C. The acceleration is constant

D. The acceleration is decreasing

Question 10

A train decelerates uniformly from 40 m/s to rest over a distance of 500 m.

How long does it take to stop?

A. 20 s

B. 25 s

C. 12.5 s

D. 50 s